ALL YEAR TRACTION TIRE STUD SYSTEM.

Background of the invention.

1. Field of the invention.

The present invention relates to a movable tire stud system that allows adjustability of tire studs while a vehicle is either in motion or parked to quickly help solve the problems related to driving on slippery and icy roads.

2. Discussion of the background.

Many attempts have been made to solve these problems. Most systems do not function properly over long periods due to the considerable wear and tear the studding equipment must endure during the course of driving. Some adjustable studding systems require air pressure to move studs in and out. Unfortunately, such systems function inefficiently. When the studs are pressed against road surfaced, the air tends to compress. Thus the studs are forced back down into the tires. A similar effect of insufficient pressure is seen when air is entering vehicle brake system hoses. Other systems require studs to penetrate the tire casing. This is considered by professionals to be quite unacceptable in the long run due to the heavy friction, wear and tear leading to air leakage and humidity penetrating into the tire causing steel belt corrosion and thus tire separation within a short period of time. Other known systems of movable studs are useless because the studs are either too big, too complicated, expensive, or they consist of components that are vulnerable to sandy water, frost, shocks etc. and consequently become easily damaged, jammed or worn too quickly.

Norwegian patent application #861224 shows an arrangement of studs and consists of a movable wall which combined with the inner wall of the tire forms an air chamber. Consequently, the above mentioned problems are not solved in that system because it is based on air and requires penetration of the tire casing. German laid-open application #2602544 and #1680491 and U.S.Pat.Nos.3,766,956, 3,340,921 and 3,095,918 are likewise either based on the use of air or penetration

of the tire casing thus leaving the above mentioned problems unsolved. Besides, such movabl stud types often need much space. Moreover, when placing movable studs under or in the tire tread, a considerable tread thickness is normally required. Thick tread tends to cause tire heating and consequently reduced driving quality.

Icelandic laid-open publication #131970 also shows a system of movable studs based on air pressure and has all the disadvantages mentioned above. Furthermore, such a system of hoses rotating inside the tire at a high speed increases the danger of explosion (flat tire). Moreover, a flat tire will probably also damage this studded system.

U.S. Pat.No.2,941.566 uses fluid to move the studs, but requires penetration of the tire casing thus leaving the above mentioned problems unsolved.

Summary of the invention.

Experiments confirm that the stud system mentioned herein has several advantages. First, it is more durable than the air systems and hydraulic systems of the cited publications because of the combination of stud jacks mounted in the shoulder of the unsiped tread blocks and the construction of the system being similar to a vehicle's brake system. When pressing the brake pedal, the piston in the brake cylinder is forced against the brake shoes. In the present invention, the tire studs are pressed against the road surface by an equivalent force. Another advantage is that wires will not leak like fluids or air systems and are more durable on bumpy roads. Adjustment of the studs can also be made possible in a simple manual fashion via a handle.

Different from the above cited publications, the studs of the present invention are mounted in extra large, unsiped shoulder blocks of the tread without penetrating the tire casing. Studs may also be mounted elsewhere on the tire tread if allowed by the tire dimensions, for instance on truck tires. Regarding this system for smaller vehicles, few tires have shoulder blocks of the tread of the necessary dimension.

However, it is possible to produce such tires.
Some rugged terrain tires have sufficient tread thickness for mounting small movable studs without penetration of the tire casing. Adaptability of the stud system may be improved through further development.
Practically speaking, a functioning system of movable studs is required infrequently. This system gives vehicle owners the convenience of not having to change tires every autumn and spring or use chains. While traditional studding systems are in use the whole winter season and are quickly worn out, movable studs will stay sharper because they are not used as often. Sharper studs means better traffic safety. Studs being used continuously throughout the winter season also means enormous extra expenses for road maintenance as well as increased air pollution. Because stationary studs are used throughout the winter season, they must be smaller than movable studs to reduce wear on roads. Consequently, professionals point out that movable studs may protrude more than traditional stationary studs, thereby reducing the breaking distance on icy roads considerably, especially compared to tires without studs. There is generally no better alternative than using tires with good studs when driving on newly fallen snow on icy roads.
Consequently, there is an obvious need for the movable stud system as presented herein. The need is met by making available a stud system of the type precisely defined in the appended patent claims.

Description of the drawings.

The stud system in accordance with the present invention is hereby described more closely by referring to exemplary embodiments thereof and with reference to the enclosed drawings wherein:

Fig.1 shows a cross section of the wheel and the studded tire wire system.

Fig.2 shows the wheel seen from the outside/the side of the wheel facing outwards.

Fig.3 shows the same side of the wheel as in fig.2, but with the hub cap on.

Fig.4 shows a cross section of the wheel when using a more simple manual tire stud system.

Fig.5 shows the same as fig.4, but with somewhat less straight studs, designed more according to the shape of the tire.

Fig.6 shows details by the shoulder block for the manual stud system seen from the side facing outwards.

Fig.7 show details by the shoulder block for the best system offering drivers remote control traction from the driver's seat.